**CV CP literature Review**

**Paper 1**

**Literature review:-**

Tn this paper author discuss smart cars can detect and recognize traffic signs by the proposed algorithm. Initially, spatial threshold segmentation is employed by the HSV color space, and traffic signs are effectively detected to support the features. Secondly, the classical LeNet-5 Conv.NN model is extended to improve the recognition rate. Finally, the detection, recognition, and classification of traffic signs are conducted to support the GTSRB

HSI and RGBB color spaces

Hue saturation color space features

HSV color model ---- this color model remap RGB color model into more human friendly propoetion

HSV model

-- H ->represents the color swaps in the image

S ->represents the proportion of current color integrity (0 to 1)

V - indicates the image brightness

In Hue - saturation value color space

V - is mostly fixed

H and S - changes only

Therefore it has better illumination flexibility whenever the conditions change. The

processing complication is also less, which is favorable for segmentation for traffic

sign detection

Traffic Sign Recognition

1) LeNet-5 CNN Model

- due to the drawbacks of this model they have to modify the model to extended version

- they added the advantages of COnv.NN model in graphics identification.

2) Extended LeNet-5 CNN Model

Paper 2:-

Traffic sign recognition using convolutional neural networks IEEE 2017

This paper discuss about two techniques for traffic sign recognition in which the first approach is based on the **color segmentation technique** and **convolutional neural networks (C-CNN),** while the second one is based on **the fast region-based convolutional neural networks approach (Fast R-CNN)**. Here traffic sign are divided into 3 different categories regulatory sign , warning sign, guide sign. The C-CNN method consists of selecting a set of regions for interest (ROIs) by applying a color tresholding on the input image, thus reducing the search space. Then, a trained CNN is used to classify the ROI (whether it contains a traffic sign or not), followed by another CNN with the same architecture that is used to recognize the detected traffic signs.The Fast R-CNN method employs several techniques to improve training and testing speed while also increasing detection accuracy, it trains the very deep VGG16 network 9× faster than the regular R-CNN and it is 213× faster at test-time. Author used python language for implementation. For color segmentation, he used the OpenCv API and the well-known deep learning API Keras with Tensorflow backend were used to train the CNNs models in both approaches. The CNN approach shows 93% accuracy with datset of 93583 images and R-CNN gives 94% accuracy with the data set of 600 images.

Link-- [IEEE2017 traffic sign recognition using convolutional neural networks.pdf](file:///C:\Users\cheta\Downloads\TY_2nd_sem\CV\CP_papers\IEEE2017%20traffic%20sign%20recognition%20using%20convolutional%20neural%20networks.pdf)

3) Deep Transfer Learning for Traffic Sign Recognition

[IEEE2018 Deep transfer learning for traffic sign Recognition.pdf](file:///C:\Users\cheta\Downloads\TY_2nd_sem\CV\CP_papers\IEEE2018%20Deep%20transfer%20learning%20for%20traffic%20sign%20Recognition.pdf)

This paper discuss the deep transfer learning. his research shows transferring knowledge between deep learning classifiers can provide higher accuracy for traffic sign recognition than a model which implements only deep learning to recognize traffic signs. This paper propose three deep transfer learning methods, and two of them demonstrate significantly improved accuracy compared to the simple deep learning classifier. The author perform TARGET ONLY DEEP LEARNING FOR TRAFFIC SIGN RECOGNITION. This paper also propose different ;transfer learning methods like weight Initialization transfer Learning (WITL), Feature Concatenation Transfer Learning (FCTL), Prediction Combination Transfer Learning (PCTL). The output of using all those transfer learning algorithms was when auxiliary dataset was significantly larger than target dataset, both methods provided significantly improved results. However, when the auxiliary and target data both contain approximately the same amount of data, the proposed FCTL method provided improved accuracy over TOLY classification. Furthermore, we observed that when the target dataset is very large and the auxiliary dataset is very small, our proposed methods did not provide improved accuracy results over the TOLY method. It is also important to note that this research was focused on static images of standard traffic signs rather than dynamic signs or traffic signals such as lights. Future research can experiment with these variables as well as dataset sizes and number of network layers.

4) INDIAN TRAFFIC SIGN BOARD RECOGNITION AND DRIVER ALERT SYSTEM USING CNN

[IEEE2020 indian traffic sign board recognotion and driver alert system using CNN.pdf](file:///C:\Users\cheta\Downloads\TY_2nd_sem\CV\CP_papers\IEEE2020%20indian%20traffic%20sign%20board%20recognotion%20and%20driver%20alert%20system%20using%20CNN.pdf)

This paper discuss the splitting the field procedures under review into two groups possibility based and form based system. The proposed system is exhaustively apportioned into, data planning, data gathering, and getting ready and testing. System uses variety of picture planning strategies to improve the image quality and to oust non-illuminating pixel, and recognizing edges. Feature extractors are used to find the features of picture. Moved AI figuring Convolutional Neural Networks (CNN) is used to gather the differing traffic sign pictures reliant on their features by using the progressing camera. This paper propose the calculation for location and confirmation of street sign which comprises of four particular parts. At first arrangements with the change of street picture from RGB shading model to HSI shading model for removing up-and-comer districts and to maintain a strategic distance from the enlightenment affectability of shading. In the following part the district of intrigue is refined utilizing marking and sifting and distinctive geometrical properties, for example, territory, perspective proportion and edge for grouping. This paper also uses the traffic sign identification strategies by utilizing propelled AI order based methods.

5) Automatic Traffic Sign Recognition Artificial Intelligence - Deep Learning Algorithm

[2020 IEEE Automatic traffic sign recognition AI-deep learning algorithm.pdf](file:///C:\Users\cheta\Downloads\TY_2nd_sem\CV\CP_papers\2020%20IEEE%20Automatic%20traffic%20sign%20recognition%20AI-deep%20learning%20algorithm.pdf)

6) Real Time TSR Using CNN and OpenCV

[IJRPR 2022 real time detection using CNN and open CV.pdf](file:///C:\Users\cheta\Downloads\TY_2nd_sem\CV\CP_papers\IJRPR%202022%20real%20time%20detection%20using%20CNN%20and%20open%20CV.pdf)